

### ABSTRACT

A motor is disclosed that uses magnetic propulsion for generating movement along a travel path in which the motor controller is mounted onboard the thrust block, thereby reducing connections the need for a remote motor controller. The motor includes a thrust rod extending along a travel path. The thrust rod includes an array of magnets arranged along the travel path arranged to create magnetic fields spaced along the travel path for generating magnetic propulsion when electrical coils on the thrust block are energized. The thrust block comprising a mounting body, electrical coils, and the onboard motor controller. The block may integrally provide a bearing surface that slides along a rail that may also provide the mounting structure and main support for the motor. A encoder mounted to the thrust block with a scale mounted directly to guide rail is also provided.